

' B O L I D E ' Contributions 0101 - 0115

- 0101 Clarke, Rev.C.C., *The Hundred Wonders of the Modern World*, p431-434, 1835 (Skinner)

0102 L. Koenigsfeld, 'A propos de...la foudre globulaire', in *Ciel et terre*, vol 95, 207-208, 1979 (Hallet)

0103 'Illumination of the sea' from the *Kolnische Zeitung*, 19.06.1870 via *Nature*, 30.06.1870 (Hallet)

0104 Sunderland, P G, 'Ball lightning in Yorkshire', in *Weather* 43:343, 1988, via *Science Frontiers* 64, Jul-Aug 1989 (Corliss)

0105 E. Lagrange, 'Une aurore boreale artificielle' in *Ciel et terre*, year 4, 1883-4, p148 et seq (Hallet)

0106 D.P.Penhallow, 'A blazing beach', in *Science*, vol xxii, no 572, p795-6, 15.12.1905 (Hallet)

0107 Campbell, Steuart, 'Ball lightning exposed ! Another picture puzzle...', in *British Journal of Photography*, 17.12.1987, p1537-8 (Bord)

0108 Bonney, Rev.A, 'Note on an appearance of luminous bubbles in the atmosphere' in *Quarterly Journal of the Royal Meteorological Society* 13:64, p306-310, 10.1887 (Mauge)

0109 "Fid.D.", 'Au sujet des foudres globulaires bleues', in *Ciel et terre*, p.300-1, 1934 (Hallet)

0110 (anon), 'Will o' the wisp - the fire of fools' in *The Countryman* vol.86:4, p67-72, 1981 (Skinner)

0111 'Curious lights near Pwllheli' : sequence of letters in *Byegones*, Feb-Nov 1875 (Bord)

0112 'Green meteor' and 'Shooting stars' - two 'thoughts from the past' in *Journal of the British Astronomical Association*, 84,6, p463, 1974 (Hallet)

0113 Tucker, Jennifer, 'Encounters "too real to be a dream"' in the *Tampa, Florida, Tribune*, 31.01.1989, via Lucius Farish's UFO Newsclipping Service

0114 'Presumed ball lightning', personal communication in *Science Frontiers* no 55 (Corliss)

0115 Llowarch, 'A ghost of Xmas past - or a UFO', in *Cambrian News*, Merioneth, 10.10.1986 (Bord)

- Corpse candles & will o' the wisp - some references collected by Bob Skinner (some have been included in previous bolide dossiers)

IGNES FATUI, OR MOCK-FIRES.

THESE meteors, denominated by the vulgar *Will-with-a-wisp*, and *Jack-with-a-lantern*; and, at sea, or on the coast, *Mariners' lights*, or *St. Helmo's fires*, are now considered as real exhalations from the earth, produced by gas, vapour, or some other attenuated substance, emanating from vegetable, animal, or mineral materials, and combined with the matter of light or heat, or both. Instead of being dense or solid, they are uniformly rare and subtle; and, instead of originating in the loftiest regions of the atmosphere, or beyond its range, are generated for the greater part in low marshy plains or valleys. To the fearful and superstitious they are a source of as much terror as the nobler and sublimer meteors which have just been contemplated; and it is probable that they have occasionally been the source of real and extensive damage, when in a state of actual combustion; and that they have still more frequently seduced a timid and benighted traveller into dangerous bogs and quagmires.

In ITALY, in the BOLOGNESE TERRITORY, they are so frequent, in the morass ground, that they are to be seen every night, some of them affording as much light as a kindled torch, and others not being larger than the flame of a candle, but all of them so luminous as to shed a lustre on the surrounding objects. They are constantly in motion, but this motion is various and uncertain. They sometimes rise, and at other times sink, occasionally disappearing of a sudden, and appearing again in an instant in some other place. They usually hover about six feet from the ground, differing both in figure and size, and spreading out and contracting themselves alternately. Sometimes they break to appearance in two parts, soon after uniting again in one body; and at intervals float like waves, letting fall portions of ignited matter, like sparks from a fire. They are more frequently observed in winter than in summer, and cast the strongest light in rainy and moist weather. They are most friendly to the banks of brooks and rivers, and to morasses; but are likewise seen on elevated grounds, where they are, however, of a comparatively diminutive size.

In the month of March, 1728, a traveller being in a mountainous road, about ten miles south of BONONIA, perceived, as he approached the river RIOVERDE, between eight and nine in the evening, a light shining very brightly on some stones which lay on the banks. It was elevated about two feet above them; its figure describing a parallelopiped, more than a foot in length, and about six inches high, its longest side lying parallel to the horizon. Its light was so strong that he could distinguish by it very plainly a part of a neighbouring hedge, and the water in the river. On a near approach it changed from a bright red to a yellowish colour; and on drawing still nearer became pale; but when the observer reached the spot, it vanished. On his stepping back, he not only saw it again, but found that the farther he receded, the stronger and more luminous it became. This light was afterwards seen several times, both in Spring and Autumn, precisely at the same spot, and preserving the same shape.

On the 12th of December, 1770, several very remarkable *ignes fatui* were observed on the road to Bromsgrove, five miles from Birmingham, a little before daylight. A great many of these lights were playing in an adjacent field, in different directions; from some of which there suddenly sprang up bright branches of light, something resembling the explosion of a rocket, filled with many brilliant stars, if, in the case of the latter, the discharge be supposed to be upward, or vertical, instead of taking the usual direction. The hedge, and the trees on each side, were strongly illuminated. This appearance continued a few seconds only, when the *ignes fatui* played as before. The spectator was not sufficiently near to observe whether the apparent explosions were attended with any report.

In the month of December, 1693, between the 24th and 30th, a fiery exhalation, without doubt generated in the same way with the meteors described above, set fire to sixteen ricks of hay, and two barns filled with corn and hay, at the village of HARTECH, in PEMBROKESHIRE. It had frequently been seen before, proceeding from the sea, and in these instances lasted for a fortnight or three weeks. It not only fired the hay, but poisoned the grass, for the extent of a mile, so as to induce a distemper among the cattle. It was a weak blue flame, easily extinguished and did not in the least burn any of the men who interposed their endeavours to save the hay, although they ventured, not only close to it, but sometimes into it. All the damage sustained happened constantly in the night.

Belonging to this class of meteors is the *DRACO VOLANS*, a fiery exhalation, frequent in marshy and cold countries. It is most common in summer: and, although principally seen playing near the banks of rivers, or in boggy places still it sometimes mounts up to a considerable height in the air, to the no small terror of the amazed beholders. Its appearance is that of an oblong, sometimes roundish, fiery body, with a long tail. It is entirely harmless, frequently sticking to the hands and clothes of the spectators, without doing them the least injury.

[B. Skinner]

bol. 0101

bo 1.0102

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« Ciel et Terre », Vol. 95, 207-208, 1979

A propos de ... la foudre globulaire

La première fois que j'ai entendu parler de ce phénomène c'était en 1940 par mon ancien maître, le professeur Marcel DEHALU, alors directeur de l'observatoire de Cointe (Liège) et professeur d'astronomie et de géophysique à l'université de Liège. Il m'a raconté qu'un jour d'orage, une « boule de feu » est entrée dans la cuisine, dont la fenêtre était ouverte, a fait le tour de la pièce, a tourné autour de la servante qui n'a rien ressenti, puis est entrée dans l'ouverture d'aération du poêle et est sortie par la cheminée. Cette boule n'a produit aucun bruit et n'a donné lieu à aucune explosion.

En 1947, revenant un jour à moto de la station magnétique de Manhay, je suis arrivé à Liège au pont de Fragnée dans un orage extrêmement violent. A un moment donné, après un éclair, j'ai vu la foudre globulaire à quelque deux cents mètres : c'était une sphère d'environ 25 cm de diamètre qui flottait comme une bulle de savon à une hauteur de près de dix mètres et qui se déplaçait à la vitesse d'environ un mètre par seconde. Ce phénomène a duré environ cinq minutes. La boule venait dans ma direction et me faisait grand peur. Elle a traversé le quai Mativa, l'Ourthe et a longé la Meuse pour ensuite devenir invisible ; il y eut alors un bruit énorme, mais je ne puis dire si la boule a explosé ou si c'était un autre éclair, ils se succédaient de très près. A aucun autre moment, je n'ai entendu de bruit ni senti d'odeur. La couleur de la boule était rose bleuâtre, comme irisée.

Plusieurs théories de la foudre globulaire ont été proposées, mais aucune, à mon avis, ne donne une explication complètement satisfaisante. Aucun des phénomènes décrits par d'autres auteurs ne correspond d'ailleurs exactement à l'expérience que j'ai vécue personnellement ! Le problème de la foudre globulaire est très complexe par le fait même que la majorité des auteurs des théories explicatives n'ont pu la voir eux-mêmes et doivent se contenter d'une description dont on ne sait pas si elle est tout à fait correcte. Parmi les diverses théories, il en est qui donnent une explication physique raisonnable ; d'autres, par contre, ne résistent pas à la critique.

Dans un article de synthèse publié récemment dans un ouvrage intitulé « Lightning » (vol. 1, Physics of lightning, Ed. R.H. Golde, Academic Press, 1977), S. Singer fait le point des connaissances sur la foudre globulaire. Il apparaît clairement qu'un grand nombre de publications ont été consacrées ces dernières années à ce phénomène. Nous nous contenterons ici de faire quelques commentaires sur quelques-unes des théories.

L'illusion optique, qui a été parfois invoquée pour expliquer la foudre en boule, ne peut en tout cas s'appliquer au cas que j'ai vécu et a duré suffisamment longtemps. D'autre part, la boule n'était pas tellelement aveuglante : on pouvait la regarder sans être ébloui et, par suite, on ne peut expliquer la durée du phénomène par une quelconque persistance rétinienne.

Les caractéristiques principales du phénomène, déduites de l'ensemble des observations, sont les suivantes : forme généralement sphérique, diamètre moyen de la boule d'une vingtaine de centimètres, couleur souvent orange ou rouge, durée d'observation de quelques secondes à quelques minutes, mouvement horizontal ou vers le bas, vitesse de l'ordre du mètre par seconde. Ces « globules » entrent généralement dans les maisons par les portes, fenêtres ou cheminées, la plupart silencieusement, et disparaissent sans laisser de trace tandis que d'autres explosent souvent sans dommage. Il semble évident que la boule de feu soit emportée par le courant d'air existant dans la maison.

Bien que de nombreux cas d'observation ont été contestés et que la plupart des photos publiées soient douteuses, l'événement dont j'ai été le témoin et le récit de M. Dehalu m'ont convaincu de l'existence du phénomène.

Dans le modèle proposé par Uman et Helstrom (Journal of Geophysical Research 71, 1966), la théorie est basée sur la conductibilité non linéaire de l'air chaud et sur la différence du champ électrique entre le nuage et le sol. Dans cette théorie, la température de la boule doit être supposée très élevée, entre 4.000 et 8.000 degrés.

Dans la théorie exposée par M. Dauvillier (Revue Générale de l'Électricité 79, 433, 1970), la foudre globulaire est « constituée par un tourbillon gazeux issu du nuage orageux ou même d'une tornade, foudroyé ensuite en constituant un anneau de plasma ». Cette théorie correspond aux diverses descriptions et, notamment, la densité de la boule doit être faible par rapport à l'air ambiant car elle s'élève parfois, ce qui peut s'expliquer par de l'air plus chaud dans la sphère.

Parmi les autres théories, citons encore celles faisant appel à l'existence d'un plasma, de réactions nucléaires ou d'antimatière.

En conclusion, on peut dire qu'en l'absence de connaissances suffisantes et d'études expérimentales, les simples descriptions des phénomènes observés ne peuvent être décisives. Le nombre peu élevé d'observations de la foudre globulaire ne permet pas de choisir parmi les théories qui tentent d'expliquer ce phénomène que nous ne pourrons mieux comprendre qu'au prix de recherches expérimentales.

L. Koenigsfeld,
professeur émérite, Université de Liège.

Communiqué par Marc HALLET

bol. 0103

June 30, 1870] vol 2

NATURE

ILLUMINATION OF THE SEA

THE following is derived from the *Kölnerische Zeitung*
of June 19:—

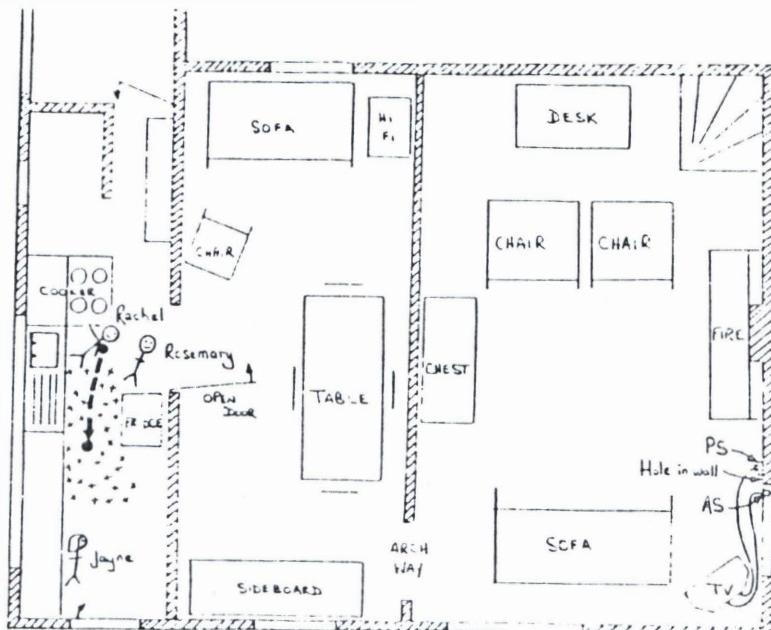
"Gulf of Siam, April 11
"Last night, between two and three o'clock, I had the opportunity of witnessing an illumination of the sea of the most peculiar kind. It had become quite calm, after a sharp breeze which had sprung up from the N.N.W., caused by a passing storm in the distance. Heat-lightning was still very frequent in the west horizon, and the sky was covered with light clouds, through which the moon shone rather brightly. We took in sail and set the engines going. I then noticed in the water large white flakes which I had at first taken to be reflections of the moon; they were about a fathom in diameter, apparently lustreless, and of no particular shape, like objects seen lying deep in the water. By the rising and falling of the sea's surface these flakes floated off to a short distance from the ship without imparting any noticeable increase of brightness to the water illuminated by the moon's rays. After steaming further forward for six or seven knots, a most wonderful spectacle presented itself. On both sides obliquely in front of us, long white waves of light were seen floating towards the ship, increasing in brightness and rapidity till at last they almost disappeared, and nothing was observed but a white lustreless, whirling (*schwirrendes*) light upon the water. After gazing for some time it was impossible to distinguish between water, sky, and atmosphere, all which were but just now clearly distinguishable, and a thick fog in long streaks appeared to be driving upon the ship with furious swiftness. The phenomenon of light was somewhat similar to that which would be produced by the whirling round of a sail striped black and white so rapidly that the white stripes seem to be lost and blended with the dark ones. The light was just as if we were enveloped in a thick white fog. The direction of the waves of light upon the ship was always on both sides obliquely from the front. The phenomenon lasted about five minutes, and repeated itself once more afterwards for about two minutes. Without doubt, therefore, shoals of small creatures in the water were the cause of this luminosity, and the waves of light find their cause, according to my conviction, in the white flakes above described. Yet their moderate velocity of $1\frac{1}{2}$ geog. mile per hour, and the weak light at first emitted by each flake, so weak as not to influence the tint of the surface-water, does not seem calculated to call forth a phenomenon of such magical effect as the one described. The luminous appearance commonly seen in the wake of a ship, or in water disturbed by oars or rudder, is not to be compared with such a phenomenon as the above. In the former the light is lustrous, glaring green and blue, like phosphorus, often very splendid in deep clear water, mingled with a reddish white foam. We saw a beautiful instance of this kind one night, in perfectly still and smooth water, in a lonely bay of Nipon. It was pitch dark and perfectly quiet, when a heavy shower of rain came on, in large but not dense drops. Every drop as it struck the water became illuminated, little drops of fire sprang up in the air, and a little luminous circle formed itself. It seemed as if the bay was suddenly filled with little flowers of fire. This phenomenon was almost immediately dissipated by a puff of wind."

From : Marc HALLET (Belgium)

bol.0104

BALL LIGHTNING IN YORKSHIRE

May 14, 1985. Yorkshire, England. "At Garton-on-the-Wolds, two miles west-north-west of Driffield and 60 metres AMSL, the electricity went off at 6.15 pm. Half an hour later Mr and Mrs Foster, who were in their paddock tending to the horses during the thunderstorm, heard a 'terrific bang'. On arriving back in their house they found that the television aerial had been blown out of its socket and there were scorch marks on the window sill and curtain lining. The television plug's negative and positive pins had been blown out of the socket but the earth pin was still intact. A hole some 8 cm by 10 cm across and 4 cm deep was found in the wall by the side of the socket. Several components of the television were damaged and fuses in the main fuse box were blown. Also, at 6.45 pm, Mr and Mrs Foster's daughters, Rachel and Rosemary, were with a friend in the kitchen at the other side of the house. Rachel was standing with her hand on the cooker when, without warning, she felt 'a sort of thump' in her back. The other two girls saw an orange, spherical



object---about the size of a table tennis ball ---moving very quickly. It had no smell, made no noise and seemed to be rotating. The ball of light did not harm Rachel's clothes but made a red, five-pointed star mark on her left shoulder blade which subsequently cleared the following day. The ball then fell onto the wet floor where it exploded 'with the noise of a shotgun' and 'like a firecracker' into many white stars. There were no burn marks on the floor although there was a smell of burning in the air---but this may have been the television." (Sunderland, P. G.; "Ball Lightning in Yorkshire, May 1985," Weather, 43:343, 1988.)

[W.R.Corliss,
Science
Frontiers 64
Jul-Aug 1989]

bol. 0105

Une aurore boréale artificielle.

Il y a huit mois à peine, le professeur Tait, d'Edimbourg, rappelant les traits généraux des phénomènes dont l'atmosphère est le siège, appuyait sur ce point que l'expérience tentée sur une grande échelle pourrait probablement seule conduire à l'éclaircissement des phénomènes dûs à l'électricité atmosphérique. Cette pensée lui avait sans doute été inspirée par un fait remarquable dont il avait fait mention dans la même conférence. Il racontait à son auditoire une observation faite autrefois par le capitaine Sabine tandis qu'il se trouvait à l'ancre auprès de l'île de Skye, dans l'archipel des Hébrides : le plus haut sommet de cette île se distinguait chaque nuit par une apparence des plus extraordinaires ; les nuages qui l'entouraient paraissaient comme enflammés par un fluide lumineux sortant du pic, et présentaient tout-à-fait l'apparence d'une aurore boréale simplement locale. Le fait observé par Sir Ed. Sabine, était un phénomène purement naturel ; mais pourquoi ne tenterait-on pas de le répéter d'une façon quelconque et d'en faire en quelque sorte une expérience de cabinet ? — L'illustre physicien n'avait peut-être pas songé que ses paroles seraient si bien entendues et trouveraient sitôt une confirmation ; cette confirmation même a dépassé ce que l'on attendait, car M. Lemström vient cet hiver de réaliser, par les procédés de la science, dans les montagnes de la Finlande, ce que la nature seule a fait à Skye.

Aucun pays de la terre ne présente peut-être comme la Norvège autant de circonstances favorables à l'observation de l'aurore boréale et de tous les phénomènes qui s'y rattachent ; il semble aussi que les savants norvégiens aient pris à honneur d'élucider cette intéressante question et de se dévouer à l'étude d'un météore qui ne peut être bien étudié que chez eux. Déjà, comme l'on sait, en 1878, M. Sophus Tromholt, un de ces chercheurs infatigables, avait pris l'initiative en demandant à tous ceux pour qui les intérêts de la science avaient quelque valeur, de vouloir bien lui envoyer les observations qu'ils pourraient faire au sujet de ce phénomène. Sa voix fut largement entendue : aujourd'hui même ce n'est plus à la Norvège seule que le rôle d'observateur est réservé ; la Suède, le Danemark, la Finlande, l'Angleterre, l'Irlande, sont aussi depuis cette époque entrés avec ardeur dans la voie de l'observation régulière ; et actuellement plus de 1500 personnes dans les Etats du nord de l'Europe coopèrent à cette grande étude, d'où tant d'efforts réunis feront certainement jaillir la lumière.

Le docteur Terby (1) nous a donné dernièrement dans cette

(1) Voir *Ciel et Terre*, 3^e année, p. 553.

revue, un résumé des résultats si remarquables que M. Sophus Tromholt a déjà acquis à la science et qui ont fait sensation dans le monde savant. Les expériences du professeur Lemström sont d'un autre intérêt, mais tout aussi vif.

L'origine électrique de l'aurore boréale n'était certes plus un sujet sujet à caution : trop de preuves étaient venues s'accumuler pour qu'il fût encore possible d'en douter, et parmi ces preuves l'influence remarquable de ce phénomène sur la marche de l'aiguille aimantée était encore la plus frappante ; de la Rive, d'ailleurs, comme l'on sait (1), était parvenu dans une expérience fameuse à reproduire dans son cabinet l'aurore polaire avec ses traits les plus caractéristiques, en prenant pour base une théorie explicative ; ce que vient de réaliser M. Lemström, c'est l'expérience telle que la nature la produit dans certains cas simples ; après lui, on ne peut plus douter que l'aurore boréale ne soit un phénomène électrique, car on l'a réalisé expérimentalement, comme on avait conclu théoriquement.

Disons en deux mots, car nous n'en savons pas plus jusqu'ici, quelles furent ces expériences ; on va juger de suite qu'il ne fallait pas peu de persévérance et de courage pour en venir à bout. Le professeur Lemström construisit sur le sommet de deux montagnes, que leur forme conique nettement caractérisée semblait rendre propres à ses expériences, un véritable réseau tel qu'un filet, mais à mailles de cuivre ; cette espèce de cage métallique placée à environ trois mètres de hauteur au-dessus du sol, était en un grand nombre de points hérisse de petites tiges terminées en pointes, de façon à faciliter la sortie ou l'entrée du fluide électrique, en un mot jouant le rôle de véritables paratonnerres. De plus ce réseau métallique était relié à la base de la montagne par un conducteur sur lequel on avait intercalé un galvanomètre, et il prenait sa communication avec le sol au moyen de plaques métalliques

(1) Voir *Ciel et Terre*, 4^e année, p. 136.

telles que celles dont on se sert dans le service télégraphique. Toutes ces installations furent faites sur les collines d'Oratouturi et de Pietarintunturi, dans le nord de la Finlande, et en plein hiver, par des froids rigoureux où le thermomètre descendit à plus de 32° sous zéro. Il est vrai que c'étaient là les conditions les plus favorables à la production du phénomène, mais on voit que la science a parfois besoin d'hommes aussi énergiques que savants pour parvenir à l'éclaircissement des mystères de la nature. Quoiqu'il en soit, à peine cette sorte de grand conducteur entre la terre et l'atmosphère fut-il terminé, que le sommet de la colline se mit à briller d'une lueur assez vive, qui se propagea même sous forme d'arc lumineux jusqu'à une hauteur de 120 mètres au-dessus du sommet. /

En fait le professeur Lemström avait facilité l'écoulement du fluide électrique; il avait aidé la nature à accomplir le phénomène qui, en temps ordinaire, ne se serait produit qu'avec une tension plus considérable du fluide, imposant à se dégager du sommet de la montagne. Il n'y avait d'ailleurs pas à douter de la réalité du phénomène; si l'on avait pu encore conserver quelque doute au sujet de la complète identité de l'aurore boréale avec l'effet produit par cette expérience, les observations spectroscopiques auraient suffi pour le faire disparaître. La raie $\gamma = 5569$, si caractéristique de l'aurore polaire, et présente dans le spectre de l'arc lumineux artificiel, vint se montrer comme le témoin irrécusable de l'assimilation des deux phénomènes. Malheureusement les conditions atmosphériques nécessaires à la production du météore furent justement ce qui en vint contrarier la continuation, qui eût été si favorable à une étude plus complète de toutes les circonstances dans lesquelles il se produit. La glace recouvrit bientôt en telle quantité les conducteurs qu'ils se brisèrent sous son poids, et par là même fut arrêté instantanément le spectacle intéressant qu'ils avaient permis d'observer. Les frais considérables qu'entraînent de pareilles entreprises ne permirent pas au professeur Lemström de pousser

plus loin ses investigations; il craignait même de devoir les abandonner tout-à-fait; mais probablement le gouvernement suédois et l'initiative particulière lui ont-ils depuis lors permis d'entreprendre de nouvelles études; il vient en effet, en envoyant à l'Académie des sciences de France une note sur ses expériences, d'en promettre la continuation pour l'hiver prochain. Le fait général acquis, il reste encore d'ailleurs bien des points à élucider, et le professeur les précise lui-même dans la note dont nous parlons. En premier lieu, on peut se demander à quelle disposition l'on devra s'arrêter pour obtenir pour une surface donnée un courant d'écoulement d'intensité maxima; cette intensité même, quelle est sa relation avec la grandeur de la surface recouverte; enfin quelles sont les influences de la latitude, de la saison, de la différence d'altitude entre les deux points extrêmes du système conducteur, le haut et le bas de la montagne dans l'expérience décrite. Toutes ces questions, ainsi que celle de la relation avec les mouvements de l'aiguille aimantée, sont du plus haut intérêt, et nous avons tout lieu d'attendre de M. Lemström, dont l'énergie et la valeur sont bien connues, des résultats favorables qui permettront de les élucider.

E. LAGRANGE.

[Marc Hallet]

bol.0106

A BLAZING BEACH.

In the early part of September the papers throughout the country gave wide publicity to the occurrence of a phenomenon at Kittery Point, Me., which attracted much local consideration because of its sensational aspects, and which might be correctly described as a

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'blazing beach.' On the evening of Friday, September 1, the guests at the Hotel Parkfield were startled by the appearance of flames rising from the beach and from the surface of the water, an event of so remarkable and unusual a character as to excite great curiosity and some alarm. The conflagration occurred between seven and eight o'clock in the evening, and lasted for upwards of forty-five minutes. The flames were about one foot in height. They were accompanied by a loud and continuous crackling noise which could be distinctly heard one hundred yards away, while at the same time there was a very strong liberation of sulphurous acid fumes which penetrated the hotel, drove the proprietor and his staff from the office and filled the other rooms to such an extent as to cause great inconvenience to the guests. One guest of an investigating turn of mind secured some of the sand in his hand, but was obliged to drop it on account of the heat. When some of the sand was taken into the hotel and stirred in water, bubbles of gas were liberated and produced flame as they broke at the surface in contact with the air.

Some of the attempts at explanation were of a remarkable character and illustrate how far one may be carried when the imagination is not controlled by an adequate knowledge of facts. One observer stated that some vessel in the harbor had thrown overboard a quantity of calcium carbide which had washed ashore and caught fire. The most popular explanations referred the phenomenon to the effects of the blast at Henderson's Point, some six weeks before, the theory being that the explosion of fifty tons of dynamite had opened up rock fissures to such an extent as to liberate volcanic gases; while a somewhat similar theory attributed it to the earthquake of the day before, and the consequent opening up of rock fissures. With respect to the latter it may suffice to state that the earthquake may have been a contributory factor in so far as it served to give just that shaking at a critical moment which would suffice to liberate gases stored under slight pressure. The most sensational explanation was that of a resident of

the town who refused to accept the explanation I offered as altogether too commonplace, and who had 'always told the people of Kittery Point that the town was built on the edge of hell, the proof of which had now been given.'

Divesting the phenomenon of its sensational aspects, it was not difficult to reach a satisfactory explanation of all the features presented, and to eliminate explanations which had some semblance of reasonableness. The beach at the point where the fire occurred is composed of a beach ridge at its upper margin, made up of pebbles of varying size. From this ridge, a somewhat sharp slope continues the same formation outward and downward for perhaps seventy-five feet, where the pebbles are replaced by sand. This latter begins at about the half-tide mark and extends outward with a very gentle slope beyond low-water mark, so that during even the lowest tides a portion is covered by very shallow water. This sand beach extends laterally for a distance of about 175 to 200 feet, being limited in each direction by solid ledge, which forms the general construction of the shore all along the river. Over the outer portion of the sand, as also for great distances beyond, wherever there is a muddy bottom, there is an abundant growth of eel grass (*Zostera marina*) which, together with other debris of a similar nature, is continually washed upon the beach, broken up by the action of the waves and gradually buried, so that each year the deposit is increased by definite though rather slight increments. One of the well-defined features of the fire was, that it was limited to that area which is occupied by the sand. It occurred over that portion of the sand which was exposed by the falling tide, but it was also observed to extend out over the water for a distance of thirty or forty feet. Gas was found to be liberated from the exposed sand when stirred in water, and similarly gas was seen to rise from that portion of the sand covered with water. Such facts showed conclusively that the evolution of the gas was immediately connected with the sand itself and not with the adjacent rock formation, hence the theory

that rock fissures had been opened could not be regarded as resting upon a valid basis.

Observation has shown that in the salt marsh lands of the coast the underlying portions of the sod are continually undergoing decay with the formation of large quantities of sulphuretted hydrogen, with which there must also be associated certain amounts of the light carburetted and possibly also of the phosphuretted hydrogen. Personal experience has shown that such gases are stored in the decaying turf in large quantities, being often held in pockets, so that when the turf is cut they may escape in such volume as to drive one away for the time. It is also known that any decaying vegetation will produce similar results, and two explanations were, therefore, suggested as offering a solution of the problem: (1) that there was an area of buried marsh such as is known to exist in places along the coast, and that its decay had given rise to combustible gases; (2) that the accumulations of organic debris in the formation of the beach had been productive of the results observed.

That one or both of these causes would offer an adequate explanation was adopted as a tentative hypothesis, and an examination of the beach was proceeded with. It was found that the superficial layer to a depth of about one inch, consisted of freshly washed sand with which there were mingled fragments of marine plants and even fragments of land plants. Successive accumulations are thus transferred from the superficial layer to that below, which was found to be about six inches in thickness, and to consist of sand filled with all sorts of organic debris, including marine plants, fragments of wood and bones. Moreover, this layer was perfectly black, and when washed it exhibited very small, carbonized fragments of *zostera* and other marine plants, fragments of wood with a distinct surface charring, and bones of animals, the surface of which was like ebony. Below this layer there was a deposit of beach pebbles mingled with sand, and as this formation continued to the limits which it was possible to reach with the implements at hand—about two feet

—the conclusion was reached that such was the lower construction of the beach and that no buried marsh was present. This naturally led to the final conclusion that the six-inch layer, rich in organic matter, was entirely responsible for the production of inflammable gases which had been accumulated there until favorable conditions for their release were presented.

An explanation of the spontaneous combustion of these gases is not difficult. The light carburetted and the phosphuretted hydrogen are well known to ignite spontaneously wherever produced in marsh lands, thus giving rise to the well-known 'will-o'-the-wisp,' 'Jack-o'-lantern' and the *ignis fatuus*, 'corpse candle,' etc., which are well known to the folk-lore of England. That sulphuretted hydrogen was also present has been abundantly shown, and since this would naturally be set on fire by the other gases, it is possible to reach a complete explanation of a phenomenon which must have occurred at more or less frequent intervals in the past, though escaping observation through lack of combination in those circumstances which would bring it under direct notice. It would seem, however, that the possibility of such combustion on a rather large scale offers a most reasonable explanation of many forest fires, the origin of which it has hitherto been impossible to account for in a satisfactory manner.

D. P. PENHALLOW.

BOTANICAL LABORATORY,
MCGILL UNIVERSITY,
November 17, 1905.

601.0107

[Janet Bond]

Ball lightning exposed! Another picture puzzle

A further claim to have photographed this questionable phenomenon is criticised by Steuart Campbell

Monographs on ball lightning¹ refer to and exhibit several photographs alleged to show the phenomenon. Many of these photographs are of doubtful authenticity but few have been exposed! However, in 1981, I demonstrated that the Jennings photograph was caused by movement of the camera with an open shutter while aimed at a street lamp (although I was not the first to suggest this explanation).² Several alleged photographs of ball lightning display line traces similar to that in the Jennings photograph, although they do not all show pulsed traces. It is possible that *all* these photographs have the same cause (exposure to bright lights) but it is not possible to demonstrate this in every case. However there is a Russian photograph where this cause can be demonstrated. I refer to the Davidov photograph shown in Fig 1 and which, when first published, was accompanied by the following account and comment:³

A rare photograph of ball lightning

On the evening of 27 August 1957, during a severe thunderstorm which had burst over Kharkov, I decided to photograph the flashes of lightning which on this evening were occurring with unusual frequency. At approximately 23.30 hours I set up my camera on the window ledge, directed the lens towards the area of the sky where the discharges were occurring most frequently, opened the shutter and began to wait for a discharge. When the flash came I was in another room and did not actually observe the discharge; I only noticed that there was a very powerful flash outside the window. My wife, who was in the room where the camera had been set up, noticed that a kind of dry, sharp crack could be heard which reminded her of the sound of tearing fabric. I shut the lens [sic] approximately a minute and half after the discharge; the film was exposed for a total of 3½-4 minutes.

The next day I developed the film and discovered that besides the characteristic broken lines of the lightning there were some smooth curved lines. I made the prints and examined them and came to the conclusion that these curved lines represent the path of ball lightning. One of them finished its journey at the mullion of the window on the 4th floor of the neighbouring block.

The crack heard during the photographing was obviously the discharge of ball lightning. The window was not damaged, but traces remained — a charred portion of the wooden

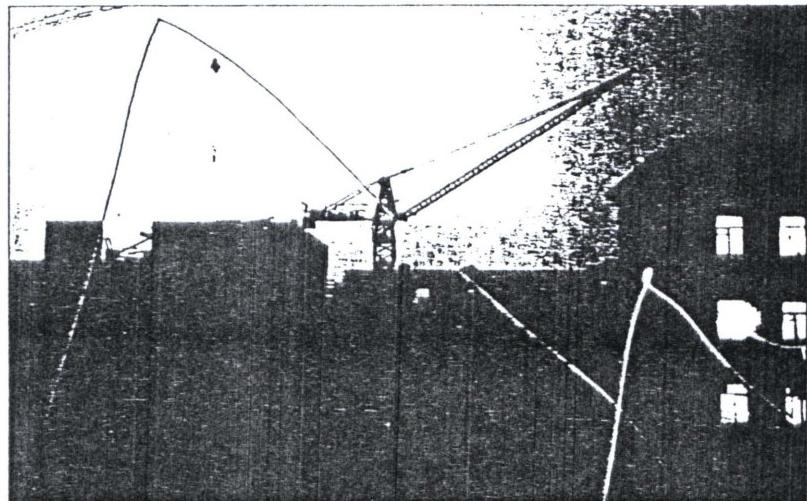


Fig 1: The Davidov photograph: ball lightning or, stationary lamps? Steuart Campbell is in no doubt as to which is the most likely answer.

part of the mullion, no longer than 3½-4cm long; on the glass strips of soot radiating outwards, 1-1½cm long; and friable putty.

The lightning was photographed with a 'Foklender' reflex camera, the lens (anastigmat skopar) with light-power 1:3.5; focal length F=7.5cm; stop-[f]11; the film negative panchromatic, sensitivity 65 GOST units. The diagrams show the disposition of the buildings in our courtyard and the trace of the lightning on the window.

B. V. Davidov [sic], Kharkov

The editorial board of the magazine 'Priroda' asked Professor I. S. Stekolnikov (The Institute of Energetics of the Academy of Sciences of the USSR) to give us his observations on the photograph of ball lightning. This is what Professor Stekolnikov said:

'In the photograph which B. V. Davidov has obtained the most interesting part is the two thin even lines coming out from the point projected on the channel of the linear lightning. From a snapshot produced by a motionless camera it is impossible to come to a firm conclusion as to what phenomenon has left its traces on the photograph — a ball, an elongated body, the branches of linear lightning and so on, and also the speed of advance of this process. It is noticeable that the width of the strips remains almost unchanged over the whole length. From this one can conclude that either the diameter of the channel becomes less as it approaches the camera or the diameter is very

small and it is beyond the capacity of the lens to give a picture of it.'

It should be noticed that a whole series of similar photographs has been published in an article "Photographs of Unusual Discharges Occurring During Thunderstorms [sic]", R. E. Holzer and E. J. Workman (Journal of Applied Physics, v. 10, 1939, No. 9, p. 659).

The photograph has been published elsewhere several times, but only Barry has commented on it. He noted that it had not been the centre of controversy, probably because of the comments by Professor Stekolnikov. Like the latter he noted its similarity to photographs exhibited by Holzer and Workman. Nevertheless he concluded that the photograph must 'remain questionable'.

The Davidov photograph can be shown to have been caused by a lamp because it contains two identical traces. What Stekolnikov called 'the two thin even lines . . .' are but two parts of one trace which is identical in shape to the trace with a loop on the right (except that in the left trace the loop is not visible). Not only are the two traces identical in shape they have the same orientation: the two arms of one trace are parallel to the two arms of the other. The existence in one photograph of two identical luminous traces

such as these has but one practical explanation. That is that the sources were stationary lamps and that their image has been traced across the film while the camera moved and the shutter was open. The direction of the traces is an invert of the direction of movement of the camera. In this case it is evident that one of the light sources was in a room in the building opposite; the trace from this lamp ends up in the sky. The relationship between the two sources indicates that the second source was away to the right and at a lower level. This may have been another naked lamp in a room, or a street light. The lack of pulses in both traces indicates that the sources were tungsten lamps.

It is surprising that Professor Stekolnikov did not see this explanation, especially since he drew attention to the curious fact that the width of the traces is constant. One of his explanations (that the width increases with distance from the camera) is so very unlikely as to be impossible! He missed the simplest and obvious explanation — that the sources were at a constant distance from the camera.

Although Davidov noticed a flash of lightning and his wife heard a crack, neither saw ball lightning. What they jointly saw and heard indicates a very close lightning strike, although this was not in the field of view of his camera.

A false trail led Davidov to a window on the fourth floor of the block opposite. The

charring and soot he found could have several causes (most likely a careless painter with a blowlamp). It is unlikely that ordinary lighting would strike below the roof level of a building only a few stories high. Davidov does not mention any inhabitants or workers in the building opposite although the lights indicate that someone was present. No-one else

Stekolnikov missed
the simplest and obvious
explanation — that
the sources were at
a constant distance
from the camera

appears to have reported seeing ball lightning, which he supposes to have flown around in the space between the buildings.

As in the Jennings case it is difficult to explain how a photographer would move his camera before closing the shutter. It may be, as suggested before, that the shutter was slow to close and remained open as it was being moved. In some cheap cameras the shutter may close slowly after being set open for several minutes. It indicates that those keen to take such long exposure photographs should not be in a hurry to move the camera after releasing the shutter.

The article by Holzer and Workman (to which Stekolnikov referred) exhibits eight photographs with anomalous traces. In one picture (taken by R J Spickerman) part of the trace exhibits pulses similar to those in the Jennings photograph. This shows that it at least is the trace of a fluorescent lamp, caught as the camera was moved with an open shutter. Several of the remaining pictures appear to show traces obtained in a similar manner. In one case, where it is stated that the camera rested on a porch ledge for 15 minutes, the trace is consistent with that of a torch or lamp being carried across the field of view. Holzer and Workman's lack of scepticism is remarkable. I conclude that none of the photographs shows a genuine lightning phenomenon.

I wish to thank Harry Milne for supplying me with an English translation of the article from *Priroda*.

References

- 1 e.g Stanley Singer *The Nature of Ball Lightning* (London 1971) and James Dale Barry *Ball Lightning and Bead Lightning* (London, 1980).
- 2 Stuart [sic] Campbell 'How not to photograph ball lightning', *BJP* (23 October 1981), p 1096.
- 3 *Priroda* Vol. 47, No. 1 (1958), between pp 96-97. ■

NOTE ON AN APPEARANCE OF LUMINOUS BUBBLES IN THE ATMOSPHERE.

BY THE REV. A. BONNEY, M.A.

(Communicated by R. H. SCOTT, F.R.S., F.R.Met.Soc.)

bol.0108

[Read June 15th, 1887.]

On a day in the month of January 1871, a lady residing at Park Place, Birmingham, observed the following phenomenon shortly before noon.

The weather was intensely cold, snow was lying after a fall some days previously. The sky was dull grey, with "rusty" clouds hanging rather low, the sun just showing itself, and the air was perfectly still.

The wall paper and furniture of the room in which the lady was sitting were suddenly flushed with rose colour, which gradually deepened into crimson, passing through bright gold into orange, lilac and deep violet.

It was then seen that from the centre of the level space of snow within view, a group of air bubbles, of the shape and apparent size of the coloured India rubber balls sold in the streets, rose to a considerable height and then began to move up and down within a limited area, and at an equal distance from each other, some ascending others descending.

The appearance lasted about two minutes, at the expiration of which the balls were carried away by a current of wind to the eastward and disappeared.

Another group of balls arose subsequently from the same spot, and the phenomena were precisely reproduced.

It was remarked that the balls assumed in succession the tints which had been observed on the walls of the room.

The appearance was also witnessed by a maid servant, who, on entering the room, at once exclaimed, "Oh, look at those little balls going up and down."

The above particulars were noted down immediately after a conversation with the lady who saw the bubbles, but she had frequently referred to the matter previously. Though rather advanced in years, she is in full possession of her faculties and is rather unusually keen and observant.

DISCUSSION.

Mr. MARRIOTT read the following extracts:—

(1.) Mr. MAXWELL LYTL (President of the Society of Public Analysts), at the Science Club, on August 17th, 1881, gave an account of a remarkable thunderstorm a few years before in the Pyrenees. He, with several English friends, were staying at Bagnères de Bigorre, where they fitted up an old barn as a church, there being a clergyman in the party: this was on the side of a mountain looking down a valley of some miles. On Sunday a storm came on while the service was proceeding, but soon the noise of the thunder and hail was so great that they had to stop the service, and he went about to secure the roof, &c. As he was looking out of the window he saw a ball of fire coming up the valley at a comparatively leisurely rate, say ten or twelve miles an hour: he first saw it at three or four miles distance, and it came directly towards him; it appeared about 6 feet diameter, and as it approached the church he threw himself on the ground, knowing what might happen; the ball, however, went over the house and struck a plum tree in the garden behind, which was shattered to atoms. The explosion was something terrific; and on going out they found the garden in a state of utter confusion—peas, beans, potatoes and the earth all stirred up together in one great mess, and everything completely destroyed, the ground being covered with some inches of large hailstones. No person was hurt there; but a short distance up the mountain nine shepherds had taken shelter in a cabin, which was struck and set on fire; four of the men were killed,

three died soon after from the effects of the stroke, and the remaining two were maimed for life.

Another time Mr. Lyte was chamois hunting very high up on the mountain when a storm came on below him; the lightning was an almost continuous flashing from cloud to cloud, and very vivid. As night was approaching he was obliged to descend, and as he came to some pointed rocks the electric fluid was escaping from them in bright brushes, so that he very prudently laid his gun on the ground and got into shelter till the storm passed by. It was on this day that so much damage was done to the town of Toulouse by the flood in the River Garonne, and so many lives lost.

Mr. Lyte remarked that hailstorms of a violent character were frequent in this part of France, but that they were localised, insomuch that the insurance companies refused vineyard risks in some districts, and in others graduated the premiums according to the presupposed frequency and violence of the storms. (Communicated by Mr. R. J. LECKY, F.R.Met.Soc.)

(2.) BALL OR GLOBE LIGHTNING. By R. DINES.

"On August 19th, 1886, during a severe thunderstorm the lightning struck a frame house in New Harmony, exhibiting during part of its course, as far as I can judge after careful examination, the rare case of ball lightning. A portion of this lightning passing from the storm-cloud to the earth struck the south-east corner of the building about 10 feet above the ground, and loosened part of the weather boarding. A part then knocked a hole, 2 feet wide horizontally by 6 inches vertically, in the lath and plaster of the south wall, and rose from this to the stair landing (at a turn going to the second story) around the east cornice of the room, and thence disappeared. Another portion broke a hole about 8 to 10 inches in the east plastering of the said landing at 4½ feet above the landing, which is reached from the room by four steps. The family were mostly assembled in this room, and a young lady of intelligence, about fifteen years of age, informs me she saw the ball of fire about the size of a man's head roll down these four steps and along the carpet without scorching it, out at the east door, a distance of 7 feet. In its passage it grazed the foot of the second daughter, and the family physician informed me the great toe was considerably inflamed as if burned; the mother and youngest son were blinded and almost suffocated for several minutes.

"Outside, a post in the east fence, about 17 feet from the door out of which the ball rolled, was reduced from 10 inches square to 3 or 4 inches in diameter. A tree about 1 foot in diameter, 14 feet from the said east door, was slightly barked on the west side, and had remarkable bruises considerably higher up, about 2 or 3 inches in diameter. A somewhat smaller tree, 9 feet due south from the first, was entirely stripped of its bark on the north-east side for 7 feet above the ground, leaving countless slivers hanging from that extremity 3 feet down.

"Judging from all the evidence, it seems probable that the following may explain in some measure the phenomena observed:—The storm-cloud approaching from a south-west direction as positive electricity, to meet the negative electricity of the earth, at the east fence post gave off a portion of its force to the south-east corner of the house. These facts I infer from the great explosive force at the fence post and adjoining trees, and the comparatively small damage done inside the house.

"Only a few cases are recorded of ball lightning, such as one by Flammarion, in his *Atmosphere*, p. 440, at Salagnac, France, where a globe of fire descended the chimney of a house, rolled across the kitchen door, out to a pig pen, where it killed the occupant, without setting fire to the straw on which it lay. In another case, mentioned in Brocklesby's *Meteorology*, which occurred in 1809 in David Sutton's house at Newcastle-on-Tyne, the lightning descended the chimney, and several persons saw a globe of fire advance into the middle of the room and then explode.

"I venture a suggestive explanation of the possible cause, in these cases, of this modified form of electricity, while I admit that it would not seem to apply to those cases where the ball is seen on the water. When coming down the soot of the chimney or through the dust of the crumbled plastering, might not a portion of the electricity be so enveloped in a non-conducting medium as to

render its motion slower, and its power for injury less until that charge is partially removed by striking against a good conductor? The suggestion is based on the idea that the ball would be somewhat in the condition of electricity surrounded by non-conducting glass, as in the Leyden jar, not exploding until connection is made between the interior electricity and a good conductor outside." (*American Meteorological Journal*, Vol. III, p. 383.)

(3.) REMARKABLE OPTICAL PHENOMENON. By S. ALEXANDER.

"The following account of a remarkable optical phenomenon was recently related to me by a lady living in this vicinity. She is intelligent and entirely trustworthy. Her statement has been corroborated by others. The occurrence herein related took place from twenty to thirty minutes before sunset in the latter part of June 1885.

"The weather was more than usually fine. The sky was clear, with the exception of a few clouds of the cumulo-nimbus order a few degrees above and to the northward of the sun. Suddenly there appeared a peculiarly weird and hazy condition of the atmosphere. There was an indescribable commingling and general diffusion of all the hues of the rainbow. During this state of things there appeared in the sky, on the earth, and on the trees, innumerable balls of decomposed light, presenting all imaginable colours, and apparently of about the size of a bushel basket. They were uniform in size and appearance.

"This phenomenon was confined to that region of the sky about the sun, extending but a few degrees each side of it. It lasted about twenty minutes, when it disappeared as suddenly as it came." (*American Meteorological Journal*, Vol. III, p. 486.)

(4.) OPTICAL PHENOMENON. By J. S. LLEWELLYN.

"There was observed here an optical phenomenon similar to that noticed in February Journal. June 5th, 1885, at 7 p.m., there was a haziness covering one-third of the sky in the south with a ray projecting to the east. Tornadoes occurred on June 7th in Iowa, Illinois and Missouri.

"Again at 5 p.m. (date lost) there was in the entire atmosphere a brownish weird appearance that was not dust. Tornadoes occurred on the same afternoon in Illinois.

"Sixteen hours before the tornado at Brownsville, Missouri, April 18th, 1882, balls of fire were seen quite numerous at a place 80 miles east of the location of the storm." (*American Meteorological Journal*, Vol. III, p. 533.)

Mr. SYMONS, after reading an extract giving an account of a comparatively recent occurrence of ball lightning, said he had worked at the subject of thunderstorms very thoroughly in the years 1857 to 1859, and had collected a number of reports of lightning phenomena which certainly disagreed with all electrical theories as to the extreme rapidity with which lightning travels. He had no doubt that lightning did frequently travel so slowly that its movements could be easily followed by the eye. He remembered seeing Mr. Varley, at one of the Meetings of the Society of Telegraph Engineers,¹ produce globular lightning, of course, on a small scale, but he caused balls of fire to travel along his machine almost as he liked.

Mr. WHIPPLE said he believed that the rate at which electricity travelled depended entirely upon the conductivity of the medium through which it was conveyed. Along telegraph wires the rate of motion was very rapid, the cables less so, whilst in rarefied air the movement was slow.² He had seen experiments made in Dr. de la Rue's laboratory in which electrical discharges in rarefied air took the form of discs whose motion was comparatively slow. In 1872 he saw a bright globe appear in broad daylight, which might possibly have been a manifestation of globular electricity, but at the time he thought it was a meteor, and sent an account of what he saw to *Nature*, describing it as "the appearance of a meteor in broad daylight." He had not seen Mr. Varley's experiments, but he had seen descriptions of something similar to ball lightning

¹ *Jour. Soc. Tel. Eng.* Vol. I, p. 33^c, & seq.

² *Phil. Trans.* Vol. 169, Part 1.

artificially produced by M. Gaston Planté. The photographs of lightning exhibited, especially those taken at Brighton, seemed to show that the lightning was really a ball of fire.

Rev. W. CLEMENT LEY said that although he had been a keen observer of lightning and thunderstorms, he had never in the whole of his experience witnessed an occurrence of globular lightning. In 1873, he saw a heavy thunderstorm come on, and the lightning struck an elm tree about 60 yards from his house. Some persons who lived in a cottage rather nearer the spot where the lightning struck than he was, said they saw a ball of fire descend with the flash, that this ball came in at the front door, and after perambulating round the room retired by way of the back door. He, however, saw no signs of this ball accompanying the flash. On another occasion the lightning struck a cow in a shed about 30 yards from his house, and some persons stated that they observed a ball of fire, but although intently watching the flashes of lightning he saw no signs of a ball of fire. He was rather sceptical respecting these appearances of ball or globular lightning, as in spite of close and careful observation he had not seen these appearances which others stated they had seen, and concerning the certainty of similar occurrences of which Mr. Symons was so firmly convinced.

Mr. MUNRO said he remembered taking shelter in a butcher's shop in Regent Street, Lambeth Walk, twenty-seven years ago, during a very heavy thunder-storm, the rainfall being one of the heaviest downpours he ever experienced. While looking out from his position of shelter, he saw a ball of fire, about 2 inches in diameter, thrown into the air from some invisible source, with streamers of fire or light diverging from it, the ball eventually bursting with a loud report. The occurrence made such an impression on his mind that he had never forgotten it.

Mr. WARING said an occurrence of globular lightning came under his notice in Ceylon two years ago. Two coolies, sheltering in a hut during a thunder-storm, said they saw a large ball of fire fall to the ground about 40 or 50 yards from where they were stationed. On hearing the account of this phenomenal occurrence from a planter very soon after it took place, he (Mr. Waring) at first believed it must have been an aerolite which had been observed, and accordingly visited the spot where the ball had been seen to fall, and found a large hole in the ground, the earth all around it being scattered in every direction. He set some coolies to work to dig in order to discover the supposed aerolite, but although they went to a considerable depth they found nothing. The vegetation in the vicinity of the hole had a scorched appearance.

Mr. H. SOWERBY WALLIS said he did not remember any descriptions of globular lightning in which more than one ball was said to have been seen, and he could not conceive of the manifestation of so many isolated particles of electricity—if he might so describe them—as were seen in the phenomenon at Ringstead Bay. The balls seen at Remenham he thought were not electrical, but bubbles caused by the escape of air or marsh-gas from under the snow, Remenham being on the Thames and he believed low ground.

Capt. THOMSON said that St. Elmo's fire, which has been very frequently observed at sea, is a form of globular or ball lightning; and described how, on board the ss. *Buccaneer* during an exceptionally severe tornado off Sierra Leone in April of this year, balls of fire were observed at the mastheads, where they remained for two hours.

Mr. EATON said, five weeks before the phenomenon occurred, he had walked along the coast-guard path, and could testify to the accuracy of the description of the locality. He first heard of this extraordinary appearance about three years ago, but as Mr. Warry had forgotten the date, he had taken no steps to bring it under the notice of the Society. However, Mr. Warry, who enjoyed excellent health, sustained a strong nervous shock from a flash of lightning in the thunder-storm on the evening of the day in question, and was confined to his bed for a fortnight; and the entry by Mr. T. B. Groves, chemist, of Weymouth, of the medical prescription, gave a clue to the precise date, which had been otherwise confirmed, and he had, therefore, communicated the Paper to the Society. Miss Warry, now Mr. Eaton's sister-in-law, was then a girl in her teens, which might perhaps account for her courage in the necessarily futile attempt to grasp the fire balls.

La Nature, 1884, Vol. II. p. 196.

bol. 0109

Au sujet des foudres globulaires bleues. --- M. Emile Mathias, Correspondant de l'Institut, Directeur de l'Institut et Observatoire de Physique du Globe du Puy-de-Dôme, dont les recherches sur la foudre et, notamment, sur les foudres globulaires, sont universellement connues et appréciées, vient de présenter à l'Académie des Sciences de Paris (1), une nouvelle Note ayant pour but de montrer que la matière fulminante modérément sulfurée est susceptible d'exister à des températures un peu inférieures à celle du début de l'incandescence du corps noir.

Dans sa statistique de la couleur de 81 foudres globulaires, le professeur Ignazio Galli mentionne, sans toutefois donner de détail sur l'observation qui a provoqué sa remarque, qu'une des foudres rouges est devenue bleue.

M. Joseph Roubille a vu à Nevers (vers 1870), au cours d'un orage avec pluie et après un fort coup de tonnerre, apparaître à 25 m. de lui, un globe de feu, légèrement ovale dans le sens de la hauteur et ayant les dimensions et la forme d'un gros ballon de foot-ball. Ce globe avait l'éclat d'un beau jaune d'or phosphorescent. Après être resté immobile pendant une quinzaine de secondes, à environ 1 m. au-dessus du sol, ce globe glissa doucement en dérive de près

(1) C. R. 199, 1934, p. 505.

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d'un mètre sur la gauche de l'observateur et se mit à tressaillir en brusques mouvements saccadiés, telle l'algue affolée d'une boussole. Il parut alors bondir sur le sol, échappant à la vue de M. Roubille qui n'aperçut plus qu'un trait de feu vertical auquel succéda, presque instantanément, l'apparition, un peu plus loin sur la gauche, d'un second globe, d'une couleur bleuâtre, qui éclata avec une violence extrême sans laisser aucune trace de son passage. Le phénomène avait duré, dans son entier, moins d'une minute.

D'après De la Hire, au cours de la tempête qui, le soir du 10 août 1695, traversa le territoire de Châtillon-sur-Seine, on assista, pendant un quart d'heure, à une pluie de feu donnant l'impression que les villages voisins étaient entièrement consumés « par le feu qui brûlait de tous côtés en bluettes semblables à celles qui sortent du fer rouge quand on le bat; après être tombées, elles roulaient quelque temps à terre et paraissaient bleues; elles s'éteignaient ensuite ».

M. Mathias rapproche ces deux observations (Nevers et Châtillon-sur-Seine) restées jusqu'ici incompréhensibles, et la remarque de Galli. Il conclut que la matière fulminante, modérément sulfurée, des foudres globulaires bleues, peut descendre au-dessous du rouge avant d'explorer, ce que ne peut faire la matière fulminante pure. L'impureté soufre apparaît ainsi comme augmentant la stabilité de cette dernière.

Le soufre qui apporte la coloration bleue existe dans le protoplasma de tous les corps vivants, végétaux et animaux, (0,3 à 2,4 %). Or, on sait que l'air tient en suspension des matières fixes et des matières organiques végétales ou animales (pollen, graines, spores, animalcules, etc.). Lorsqu'un éclair jaillit dans un air ainsi pollué, la matière fulminante (substance qui forme le reste de l'éclair) absorbe les impuretés en suspension et jouit de propriétés nouvelles. Selon que le soufre absorbé par la matière fulminante est réparti à sa surface régulièrement ou non, dit M. Mathias (1), la couleur bleue du soufre qui brûle dans l'oxygène apparaîtra en tous les points de la foudre sphérique ou seulement en quelquesuns, se superposant à celle du corps optiquement noir qu'est la matière fulminante pure.

La statistique des 81 foudres globulaires colorées du professeur Galli, doit, d'après la dernière Note de M. Mathias, être légèrement remaniée. Le nombre des foudres rouges doit passer de 26 à 25 (fréquence: 31 %) et celui des foudres bleues de 12 à 13 (fréquence: 26 %).

Fin. D.

(1) *Annales des Postes, Télégraphes et Téléphones*, juillet 1920.

(2) CHALLONGE et E. VASSY. *Revue d'optique*, avril 1934.

bo 1.0110

Will o' the Wisp – the fire of fools?

Photographs by Stuart Seager

THE VARIOUSLY NAMED Llanthony Valley or Vale of Ewyas in the eastern Black Mountains has had a special place in my affections since I was introduced to it forty years ago. Not only has it a rich wildlife, but what is loosely called 'atmosphere', even now that a through road has opened it up to continuous traffic in summer. So I was delighted when, some months ago, William Griffiths, who was born in the valley but now lives near Raglan, sent us his account of a personal experience in the 1920s under the title 'Ignis fatuus, commonly known as Will o' the Wisp or Jack o' Lantern'. The Latin means 'foolish fire'.

Mr Griffiths wrote:

'Many years ago I had the good fortune to have a grandstand view of this phenomenon, when I was returning homewards from my youthful peregrinations up the Llanthony Valley. It was a quiet, dry night in late summer, pitch black and moonless, and around midnight. I had dismounted from my bicycle to walk up a short, steep hill and was about to remount when I was aware of an intensely brilliant pumpkin-sized ball of light about 500 yards away to my right, in marshy land rising upwards toward the mountain base. I stood transfixed as the fiery ball moved around in a circle. Suddenly it took off, gathering speed every moment, and raced across the



In 1881 Father Ignatius claimed to have had an amazing vision of the Virgin Mary by the hedgerow of this field near the monastery of Capel-y-sfin. Local historian Charles Knight points out to Bruce Campbell and William Griffiths the statue that was erected nearby to commemorate the miracle. But could it have been a will o' the wisp?

first field. There were three tall, overgrown hedges in its path, at least 10ft tall and dividing small fields. It swept upwards and over the first fence in great style, but returned to ground level to cross the next field. It did the same with fence two, and sped away again to fence three and gracefully swooped up and over that one also. It continued, speed unabated, towards a copse, where it came to grief; at least, I did not see it again. I knew the location well because the land was just over our farm boundary, and I could visualise its progress perfectly; its speed was around 20 mph.'

A phenomenon worthy of Ewyas, especially when I remembered that Father Ignatius, who built his monastery at Capel-y-sfin where the valley divides, had recorded visions there some time in the last century. So I got in touch with Mr Griffiths: had he ever seen a will o' the wisp again? No, but he could give me a friend's account of what happened to his father, who is the 'lad' in the following story from Radnorshire.

'Early one September morning, when it was still dark, a farmer with a lad set out to collect a load of coal from the nearest railway station. The lad led the front horse, carrying a hurricane lamp in his left hand, while the farmer was in charge of the shaft horse. After going for some distance, they became aware of a fiery ball of light, of uncanny brilliance, some way ahead, as if held aloft by someone with a pitchfork, who in a drunken state was bobbing and lurching from side to side of the road. As the distance between them narrowed, the horses became restive. Then suddenly the lead horse reared, tried to turn and in the commotion kicked over the traces. The shaft horse was also almost uncontrollable, as the two men clung to their horses in desperation.

'The light reached them, passed on the off-side and came to a halt in the confined space between wagon and hedge. It took some time to calm the horses; then it anger the farmer leaned over the wagon to see whoever was carrying this strange light. But his anger turned to astonishment when he realised there was no one there. the ball of light was simply suspended in mid-air. As he watched, rigid with fear, the light floated silently through the roadside fence and disappeared. Not long after this encounter the farmer died. Many neighbours believed that his death was foretold on that morning when the "corpse candle" came to meet him down the narrow road.'

I went through *The Countryman's* card index and found only one reference to will o' the wisp under any of its names, a note published in Autumn 1974 (p. 64) from Miss M. Hughes, who was out one autumn evening when she saw a light travelling across the fields from her 'ancestral farmhouse' in Breconshire. As it approached, it seemed 'as large as one of those old fairground acetylene flares and looked as if it were being carried aloft by someone on a bicycle who lurched from one side of the road to another. Slowly the light approached in this crazy manner, burning ever more intensely as it came. It had almost reached me, when the brilliant flare vanished into the hedge by which I stood.' The morning after this experience Miss Hughes passed a hearse on the same road and 'the wise man of the locality' opined that the coffin must have held one of her old kinsfolk coming home.

The sources I have been able to consult agree that will o' the wisps occur in autumn on marshy ground. These three incidents, from adjacent old Welsh counties, were all autumnal, as were the visions at Capel-y-sfin in August–September 1881. But only Mr Griffiths' personal experience took place specifically on 'marshy ground'. Still, there seemed enough evidence to justify a reconnaissance of Ewyas by Stuart Seager and myself in the company of William Griffiths, his friend Charles Knight, another native of the valley and a mine of

information on the area, and Emlyn Evans, a leading Welsh geologist.

At the end of the day we knew a lot more about the valley, had visited five past or present ecclesiastical sites and I had fallen once more under the spell of Ewyas. We decided that the Abbot's Meadow at Capel-y-sfn, where the apparitions of 1881 were seen, could never have been marshy ground and they could therefore be dismissed, in spite of superficial resemblances in what was seen to a will o' the wisp. (There is a full account in chapter XLVI



William Griffiths was born in the Llanthony Valley and looks again at the place where as a young man he saw a vivid will o' the wisp travelling rapidly along a marshy bottom and rising to pass over each field hedge.

of *The Life of Father Ignatius O.S.B.*, by the Baroness Beatrice de Bertouch.) But we visited the scene of Mr Griffiths' experience, close to the river, which is now known as Hodni once more, instead of the more difficult, to English lips, Hondu.

Information about the will o' the wisp (under its several names) is as elusive as the phenomenon itself, which seems to have become much rarer in the past hundred years, perhaps coinciding with the growth of scepticism and the drainage of marshes. The account in Chambers's *Encyclopaedia* (1908) decides that 'several different phenomena have evidently been included under the name'. While some observers describe the flame as fixed, others have seen it 'in motion, bounding rapidly over the country and sometimes rising high in the air', which is a notable feature of Mr Griffiths' account and, to a lesser extent, of the other two incidents described above. But, as a more modern edition of Chambers's puts it (1968): 'It occurs quite irregularly and unpredictably and the descriptions of it differ so widely that the sceptics have suggested that it is a mere hallucination'.

Will o' the wisp has a modern champion in Allan A. Mills of Leicester University, and I am indebted to Robert Anderson of the Science Museum, South Kensington, for showing me Dr Mills's article on the subject, published last year in *Chemistry in Britain*, and several other relevant references. After quoting the accounts of reputable observers, some on the Continent, and going back to Isaac Newton himself, Dr Mills concludes: 'It does seem that the will o' the wisp was a real phenomenon once widely known throughout Europe and North America'. But explanations of it 'have been as numerous as they are unsatisfactory'.

Most accounts suggest that methane or marsh gas is the source of the flame; the difficulty is to see how it could be spontaneously ignited. Dr Mills ranges over the chemical field and describes his own experiments which, though negative in results, have not disheartened him. Dr Anderson believes that ignition is most probably caused by phosphine or hydrogen phosphide traces in methane; 'but it is clear that no definite answer has yet been agreed'. Dr Mills ends his article by inviting readers of *Chemistry in Britain* to help him: 'Is the Will o' the Wisp truly extinct, or does anyone know of a locality where it may still be seen?' What about *Countryman* readers? Meanwhile Stuart Seager and I are happy to think that we have spent a day with one of the last people to have seen *ignis fatuus* in action. □

24.2.1875

bol. 0111

CURIOUS ALMANACE OF LIGHTS.—Mr G. T. Pierton-Jones, Yoke House, Pwllbeli, writes to The Field as follows:—“Some few days ago we witnessed here what we have never seen before—certain lights, eight in number, extending over, I should say, a distance of 3 miles; all seemed to keep their own ground, although moving in horizontal, parallel, horizontal, and zig-zag directions. Sometimes they were of a light blue colour, then like the bright light of a carriage lamp, then almost like an electric light, and going out altogether, in a few minutes would appear again dimly, and come up as before. One of my keepers, who is nearly 70 years of age, has not, nor has any one else in this vicinity, seen the same before. Can any of your numerous readers inform me whether they are will-o'-the-wisps, or what? We have seen them at a time afterwards on four or five occasions.”

(Sorry about poor quality!)

10.3.1875

THE CURIOUS LIGHTS NEAR PWLLHELL.

(Feb. 24, 1875.)

Mr Pierton-Jones has been kind enough to address to us the following letter, in response to the request which we made last week for further information:—“Yoke House, Pwllbeli, 2nd March, 1875.—The curious lights appeared again on Sunday night. We saw twelve at the same time, two were very bright, the one of a red, the other of a blue colour. They were inland, the same as before, but from what we could observe they did not confine themselves to marshy ground, although at first they seemed to rise from ground where we knew there were swamps. It was a very dark and foggy night, and my brother, my son Percy, my keeper and I went out about a mile to see if we could get near them. When we had gone about half a-mile, we observed four or five behind us. We went to the farm adjoining, and called their attention to them. Mrs Pierton-Jones and two servants watched them for an hour and a-half, and had from their description a better view than we had, as we were occasionally in hollows. On our way home from Bryntani Farm we saw a bright light at Yoke House, which we all thought was a lamp put out to direct us home, the night being so dark and our course across country. The other servants, by this time, having come home from church and chapel, were watching the curious antics of the lights. I should mention that we had a lamp with us, but it was darkened, except when we came to banks or ditches. Those at Yoke House saw the same light, and thought it was our lamp, but were all mistaken; as when we got within about 200 yards of our pond the light turned into a deep blue colour and disappeared. In front of the other pool there are some sheds, and one light that had appeared before we started seemed to go in, and out, round the corner, on to the cart horse stable, round its gable end, then on to the barn, exactly the same, as if it were a human being, with the exception of rising to such a height that even ‘Tall Agrippa’ could not come up to it. Their movements and the distance over which they spread were the same as described before. Our house is about three quarters of a mile from the Cardigan Bay, and the promontory is about seven miles across as the crow flies. Last night they did not appear, but we saw several flashes of lightning.—I am, sir, your obedient servant, G. T. PIERTON-JONES.”—*Cambrian News.*

24.3.1875

THE CURIOUS LIGHTS AT PWLLHELI.

(Mar. 3, 1875).

When I first saw a notice of the curious lights at Pwllheli in the *Cambrian News* I wrote to *Notes and Queries* on the subject, and drew the attention of the editor of that interesting publication to the "Harlech Exbalations" of 1694, mentioned by Evelyn in his *Diary*, and by Gibson in his continuation of *Camden*, and put a query on the subject. I observe that Mr Picton-Jones has been reminded of these fires, and has given you an outline of Pennant's account of them. The "Mephitic Vapour" made its appearance on that portion of the coast called Morva Bychan—Little Marsh, in the winter of 1693-4, and was described as a "blue lambent flame" that burnt nothing but hay and straw, and was dispersed by the firing of guns or blowing of horns. It so poisoned the grass that cattle died if they grazed. The damage was always done in the night. Some months previously a swarm of locusts visited the coast, and died from cold, their carcases strewing the shore. More than one suggestion as to the cause of the vapour was hazarded by the historians of the time: and other latter-day tourists

besides Pennant, have tried their hands at a solution of the mystery. One of the most reasonable of these was the Rev. John Evans, whose botanical tour was published in 1800. He says, "Animal bodies in a state of decomposition emit large quantities of hydrogynous gas; this is pernicious to animal life, and, mixed with a small quantity of oxygen, becomes highly inflammable; and when it meets with electric matter, with which the atmosphere abounds, will instantly explode. A continuance of the cause would for the time produce a continuance of the effect." Mr Evans was inclined to think that the lights in this case and their duration were much magnified, and his supposition was that they proceeded from the carcases of shoals of herrings driven by whales on the strand. The curious lights recently seen at Pwllheli don't seem to have anything in common with the "lambent flames" of 1694; but when they take the form of "sheaves of corn" they are more difficult to interpret than "Joseph's Dream!" THE AUTHOR OF THE "GOSSIPING GUIDE."

24.3.1875

Having read the account by Mr Picton-Jones of the strange lights seen by him near Pwllheli, I beg to say that I witnessed a very similar phenomenon on the marshy ground near Borth. Some five or six years ago, owing to an accident on the Cambrian Railway, I had to post from Machynlleth to the neighbourhood of Towyn, where I was then residing. It would be about twelve o'clock p.m., when I came in sight of the low ground and sandy dunes between Borth and the Dovey, the night being perfectly clear and still, and the stars shining, when to my astonishment I saw four or five lights moving apparently on the sandhills near the farm of Ynyslas. I called the post boy's attention to them, and never did I see a man so paralysed with fright; I thought that he would have fallen off the box, and the perspiration as I could see by the light of the lamps fairly ran down his face. He evidently considered them of supernatural origin as he told me an incoherent story of a boat's crew of shipwrecked foreigners having been murdered when they came ashore there many years ago (upon further enquiry, I found there was some tradition of the sort.) However, there the lights were, moving about in a sort of aimless way until, as near as I can remember, we reached within a mile or two of Aberdovey. They were white, and about the size and brilliancy of the lamps carried by railway guards and porters. There is yet another phenomenon of which no satisfactory explanation has ever been given. On the 24th of September, 1854, (I refer to my gamebook for that year), a friend was shooting with me in Herefordshire, the day was perfectly still, the sky cloudless, when sounds like discharges of heavy artillery came from the west, which striking against a range of wooded hills running north and south under which we were shooting made most wonderfully distinct echoes. These discharges or whatever they were, continued for several hours at regular intervals of about two minutes. Since then similar sounds have been heard two or three times, (judging from the letters to the papers), and principally by persons living in Cardiganshire, but their origin has never yet, so far as I can see, been discovered.

R.D.

Dolforwyn Hall,

Having read in your impression of the 10th inst. a letter from Mr Picton-Jones, in reference to "the curious lights" which have been lately seen near Pwllheli, I see he quotes "Pennant's Tour in Wales," where "a mephites or pestilential vapour" is spoken of as having been observed in 1694, and as having also seriously affected animal life. In a book entitled "The Antiquities of England and Wales," by Francis Grose, Esq., F.A.S., and published in 1787, there is the following curious allusion to the county of

Merioneth:—"This county is very mountainous and unwholesome. The soil is rocky, reckoned the worst in Wales; yet produces some corn, sheep, deer, goats, fowls, game, and both fresh water and sea fish, particularly guiniad, salmon, trout, and herrings. It is subject to a livid fire or vapour that has destroyed everything in its course except its inhabitants, which made great devastation in 1542 and 1564." It would be a singular fact, if in 1875 we were revisited by the "livid fire" here referred to!

MARY EDWARDS,
Of Dolerau.

22nd March.

10.11.1875

A PECULIAR PHENOMENON.—The Rev James Lewis, of Llantilar Vicarage, writes as follows to the *South Wales Daily News* :—“ Whilst returning from service at the parish church of Rhosbie, about 8 15 p.m. on Friday, the 24th ult., in company with two members of the congregation, my attention was called to a remarkably strange phenomenon. In walking across a field on the farm of Cwmclyd, it was noticed that our footsteps were marked by a peculiar light, which could be traced back for several yards, each footprint being as distinctly marked on the ground as when one walks in snow. When we go' into the adjoining field the light disappeared until we got near to the end of it, when it was observed that our footsteps were again marked by the same luminous appearance. In colour the light was similar to that of phosphorous rubbed on a wall in a dark room, or a mass of glow-worms, of which insect, however, there was no trace on the surrounding ground.” From this it would appear that “ Curious Lights ” are not confined to Pwllheli (See Mar. 24, 1875.)

[Janet Bard]

HISTORICAL SECTION

E. A. BLET, Director

THOUGHTS FROM THE PAST 2

Some time ago one of our members, Mrs Jane D. Kirk, came across an old book entitled *Arcana of Science and Art*, printed in London by John Lind bard, 1830. Its somewhat long-winded sub-title is (in actual words but ignoring capital letters and three sizes of type) 'An annual register of popular inventions and improvements, abridged from the transactions of public societies, and from the scientific journals, British and foreign, of the past year'. Mrs Kirk selected the extracts which have an astronomical content and sent copies to the Director, who hopes that from time to time the Editor will see fit to print one or two. Some are straightforward science; some are fantasy; both kinds do give some indication of what sort of things scientists and others were writing about nearly 150 years ago.

GREEN METEOR *Extract of a letter from Mr B. D. Silliman to Professor Silliman*

'On the night of the 11th of February, between eleven and twelve o'clock, as I was crossing the East River between New York and Long Island, I observed a beautiful meteor, which was visible for the space of about two seconds. Its course was from a point perhaps five degrees below the zenith towards the horizon in a north-east direction. It described an arc of perhaps twenty degrees, when it apparently exploded, but without any report that I could hear. Its colour was a singularly pure grass-green of a light shade, and so were the scintillations which accompanied its apparent explosion. The latter were distinct, like those accompanying the bursting of a rocket, but by no means so numerous. (Silliman's Journal)'

The page-head classed the above report under 'Meteorological &c.', though one would have thought that by 1830 the nature of meteors was well known. Perhaps the singular colour was meteorological.

SHOOTING STARS

'A MR JOHN TREAT, a respectable farmer and a man of veracity, states that he was with the army of General Washington in the campaign against General Howe after his landing at the Head of the Elk. On the night previous to the battle of Brandywine, as he was standing sentinel, a shooting star fell within a few yards of him. He instantly went to the spot, and found a gelatinous mass, which, if we recollect right, was still sparkling, and he had kept his eye on it from its fall. A very respectable lady mentioned, that, as she was walking in the evening with one or two others, a similar meteor fell near them, and she pointed out the very place where it struck. The late General Griswold also informed us, that a shooting star once fell near him upon a piece of ice, as he was walking with two other persons in the street of East Hartford. (Silliman's Journal)'

[Marc Hallet]
Journal of British Astronomical Association.

TRIBUNE, Tampa, FL - Jan. 31, 1989

Encounters 'too real to be a dream'

By JENNIFER TUCKER
Tribune Staff Writer

TAMPA — They confess they haven't talked about it much. They haven't wanted to.

Even now, there is an uneasy, self-conscious rhythm to their speech, like that of a child forced to the front of the class for show-and-tell.

They are two people whose lives were changed without decision or will, and who will forever look at the sky through different eyes.

"I'm a writer. I have a wonderful imagination. So you can see my predicament," says Karen in a telephone interview from her Naples home. The 43-year-old writer and mother of three uses Karen as a pseudonym, explaining in hushed tones, "I didn't even tell my husband until six months ago."

In the fall of 1986, near Little Rock, Ark., and then again in Douglas, Wyo., something happened to Karen she can't describe — and only with the gentlest inquiry does she reveal her "odd experience."

Karen refuses to call it an alien abduction. Yet she is "so totally convinced that it was real, I know it was not one of those yoga, meditative things," Karen says.

It began in small, strange ways during the summer of 1986, Karen says. Electrical appliances in her home began to malfunction for no apparent reason — the television burned out, the washer and dryer started and stopped — and it seemed to be related to Karen.

"My children started making jokes about me staying away from the TV," she says.

One day, while seated near her computer terminal, Karen says the keys moved inde-



Tribune Illustration by JIM BREDECK
Aliens have been described as "humanoid and very intelligent"

pendently of her touch. Their message: Karen "needed" to travel west.

Completely unnerved by the strange sequence of events, Karen says she decided to heed the advice. Because she often travels to destinations described in her books, Karen says her family thought nothing of her sudden compulsion to visit the Rockies.

They noticed, however, that the electrical disturbances stopped when she left.

The electrical disturbances continue, however, and a small ball of light often appears in her study, she says.

"It left me very confused." It also left her unable to write. Karen says she was so frightened by the experience that for two years, she published nothing. She suffered nausea and dizziness. She withdrew to her study and withdrew from her family.

"I wanted to be alone but I wanted to know people were near me," she says.

Her husband's initial reaction to the experience was "totally negative," Karen says. "He's a nuts-and-bolts man. I guess he wanted to protect me ... but now he knows I'm serious."

She didn't tell her children — she still hasn't — and very rarely does she speak of it to others.

"Telling people is like learning how to walk through a field of flowers," Karen explains. "Some you can talk to and touch. Others have thorns and bristles."

"It's like when the explorers told people about all the fascinating animals. Why believe them if you haven't seen them yourself?"

Alone in a cabin

Working with a psychiatrist and a university professor, both recognized experts on the UFO phenomenon, Karen says she has evaluated her experience. She's read dozens of books on the subject, and last summer, she returned to Colorado where she spent six months alone in a cabin.

"I didn't think I was going to have a nervous breakdown ... but your mind whirls with thoughts," Karen says. "I wanted to test myself. And if I came through that, I could come through anything."

She "came through" Colorado without incident and Karen happily says the hiatus lowered her stress. Although she still can't fly — she developed crippling airsickness soon after the abduction — Karen is publishing again and studying more.

The electrical disturbances continue, however. And a small ball of light often appears in her study, she says.

"I feel I'm a better, more aware person," she says. "My character has become stronger and my work has taken on a lot more depth. Even my education has extended. I'm studying physics and chemistry and I've become very involved in the environment."

Although she concludes her experience was "basically positive," Karen isn't eager to repeat it. "You don't know if you're opening a can of tuna or a can of worms."

"But if the answers come, it's been worth all the hell and misery."

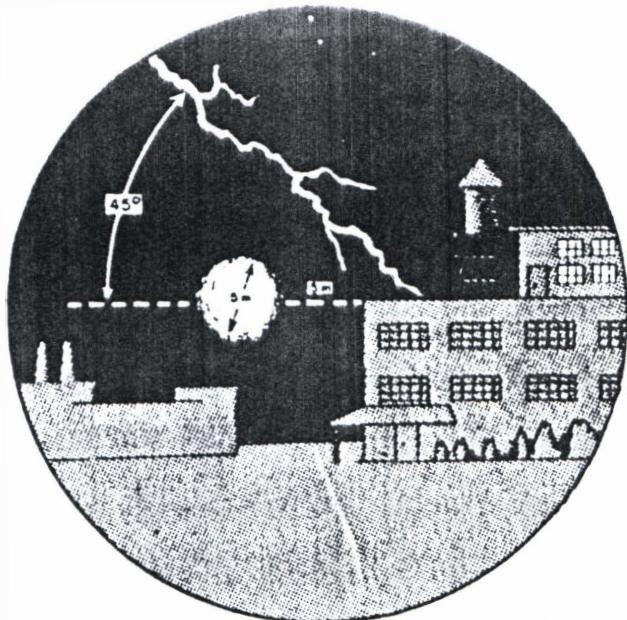
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PRE SUMED BALL LIGHTNING

"Date: November 24, 1987. Tulsa, Oklahoma. Circa 3:20 P. M. CST. Location: 2800 Southwest Blvd. in said city. Parents

of Keith L. Partain saw a lightning strike near an oil refinery storage tank. Immediately after the strike they saw a bluish sphere with red and yellow highlights, not more than 9 feet in diameter, some 100 yards away, near that tank. The sphere lasted in that form some five seconds before fragmenting in a loud detonation. During the act of detonation the sphere became an irregular spheroid before fragmentation. Mr. Partain reported that he could feel the heat from the detonation. Both individuals, seated in a truck, were quite astounded by the apparition. The weather was quite stormy and violent in its gales, rain and lightning." (Partain, Keith; personal communication, November 24, 1987.) (K. Partain checked the Catalog of Geophysical Anomalies and classified the phenomenon as GLBI or Ordinary Ball Lightning. WRC)



The ball lightning figured above was seen near an Albany, NY, factory in 1975. The event closely resembles that reported by the Partains.

bol.0115

A ghost of Xmas past —or a UFO

From the 'light in the sky' interest of a few weeks ago, there came a story from a friend of mine. In the late 1950's, he and his family lived in a house which was later demolished.

It stood in St. James Square, Aberystwyth, adjoining the auction rooms and behind the big church.

One night - in about 1958 or '59 - my friend's small daughter awoke in the night and her waking roused him. Going into her room, he noticed immediately that it was illuminated by a green light. Clearly, the little girl had been disturbed by the light.

My friend looked out of the window which faced towards the Angel Inn in the upper part of Great Darkgate Street. What he saw surprised him and he called his wife to witness the sight.

Hovering above the pub was what he describes as a "Christmas bell shaped object". The lower part of what he saw - whatever it was - was green. The upper part glowed red. And the light, in common with many UFO's pulsated.

I must mention that his wife had always been sceptical of such reported sightings, and to a certain degree she still is, but what she saw made her apprehensive.

My friend decided to leave the house and go and see if he could obtain a better view of the object. He pulled on some clothes over his pyjamas and went outside. He reasoned that the UFO could best be seen by heading towards the pier, for that was the direction in which the thing appeared to be.

Going down Pier Street, he stood to the right of the pier facing the sea. Out there, he again watched the object. Its light was reflected by the waters of Cardigan Bay, making a pathway of light to the shore in the same way the moon would.

He observed it for some time on that mild summer night. The UFO moved in some sort of pattern. It would rise, move across a little way, descend towards the water and then return to its original position. There was no noise to be heard and the sea was fairly still. Then, suddenly and surprisingly, the light zoomed off at enormous speed as if towards North Wales. My friend re-

turned home, puzzled.

Nearby, there lived a policeman and my friend mentioned the incident to him, hoping to find out if there had been other witnesses to the sighting. A little later, the policeman neighbour told him that he should have a word with another member of the constabulary who had been on duty that night.

Seeing this other constable in the town, my friend approached him. At first, the young policeman was wary. He thought my friend might be ridiculing him. The reason for his reticence soon became apparent.

On the night in question, the constable had been on duty. He had indeed witnessed something odd in the night sky, and at about the same time as my friend. In fact, he reported the matter when he went into the police station.

Most of us can be sceptical at times. Our 'funny' comments can be hurtful to someone who has seen something which can't be explained. The constable reported not only seeing this peculiar light, but also that it had landed on top of Constitution Hill. His colleagues laughed at his report. Such things don't really happen, do they? Further, he was, for a little while, suspected of drinking on duty.

It is understandable that the policeman was reluctant to tell my friends what he had seen.

The matter was not reported generally, of course. Yet, though it happened a long time ago, I feel it should not go unrecorded. Remember that this happened to perfectly reliable witnesses and it was in the days before the advent of laser beams.

The subject of UFO's has brought me so much correspondence of late that I shall return to it in a couple of weeks. In the meantime, may I wish a happy wedding anniversary to my wife...

CORPSE CANDLES & WILL-O'-THE-WISP

some references collected by Bob Skinner

For more information about the study, please contact Dr. John Smith at (555) 123-4567 or via email at john.smith@researchinstitute.org.

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